Goal 2: Protecting America's Waters			
Objective 2: **Objective 2.2**: Protect and Restore Watersheds and Aquatic Ecosystems			
Work Plan Component/Program: II. DRBC Criteria-Based Programs **Work years**: 2020:	**EPA Contact(s)**: Dana Hales, Joel Blanco	**Basin Commission Contact(s)**: T. Amidon	**PRC**: 202B06
Project Description: PCBs - Ongoing PMP Management			

Environmental Outcomes	Measures	Outputs for FY 2019 (Commitments)	Status/Comment
Implementation of Stage 1 & 2 PCB TMDLs (Zones 2-6)		• Ongoing Point Source Data Review and Assessment. Ongoing Pollutant Minimization Plan review and management. Readily available data for action level option evaluation. • By November 30, 2020 DRBC will provide a list of PMPs reviewed by DRBC and by the states, plus a slide set on PMP activities during 2020.	

Goal 2: Protecting America's Waters			
Objective 2: **Objective 2.2**: Protect and Restore Watersheds and Aquatic Ecosystems			
Work Plan Component/Program: II. DRBC Criteria-Based Programs **Work years**: 2020:	**EPA Contact(s)**: Bill Richardson	**Basin Commission Contact(s)**: J. Yagecic	**PRC**: 202B06
Project Description: Boat Run monitoring program			

Environmental Outcomes	Measures	Outputs for FY 2019 (Commitments)	Status/Comment
Assessment of Bacteria, eutrophication, metals, and conventional parameters (i.e., nutrients, dissolved oxygen, chlorides).		Management and execution of an expanded Boat Run monitoring program. All data readily available in STORET/WQX. Monitoring composed of: • 22 sample locations in the Delaware River and Bay between River Miles 6.5 and 131; • Planned monthly monitoring events in Jan, Feb, and March for routine, nutrient, and algal parameters; • Planned monthly monitoring events in April through October for routine, bacterial, nutrient, algal, sodium, biotic ligand model, pesticides, PAHs, organics, and PFAS parameter groups (select stations); Upon upload of all data to STORET/WQX, links to a pre-canned query for the resultant data set will be provided. All 2020 data uploaded by February 28, 2021 and pre-canned queries posted on DRBC web page by March 15, 2021.	

Goal 2: Protecting America's Waters			
Objective 2: **Objective 2.2**: Protect and Restore Watersheds and Aquatic Ecosystems			
Work Plan Component/Program: II. DRBC Criteria-Based Programs **Work years**: 2020:	**EPA Contact(s)**: Bill Richardson, Katherine Bentley	**Basin Commission Contact(s)**: E. Panuccio	**PRC**: 202B06
Project Description: Expanded Nutrient Monitoring - Delaware at Trenton and Schuylkill at Philadelphia			

Environmental Outcomes	Measures	Outputs for FY 2019 (Commitments)	Status/Comment
Implementation of nutrient criteria plan. Data in support of estuary eutrophication model.		Sampling and analysis of nutrients and nutrient related parameters twice per month at the Delaware River at Trenton and the Schuylkill at Philadelphia. All data readily available in STORET/WQX. Monitoring Composed of: • Sampling the Delaware River at Trenton NJ, Calhoun St. Bridge and the Schuylkill at Falls Bridge; • Analytical parameters include COD, Chloride, Ammonia, Nitrate + Nitrite, TKN, Orthophosphate, Alkalinity, Total Phosphorus, Silica, Total Residue (TS), Volatile Residue (TVS), Sulfate, TOC, and DOC; • Monitoring twice per month, year-round, for a total of 24 sampling events. Upon upload of all data to STORET/WQX, links to a pre-canned query for the resultant data set will be provided. All 2020 data uploaded by February 28, 2021 and pre-canned queries posted on DRBC web page by March 15, 2021.	

Goal 2: Protecting America's Waters			
Objective 2: **Objective 2.2**: Protect and Restore Watersheds and Aquatic Ecosystems			
Work Plan Component/Program: II. DRBC Criteria-Based Programs **Work years**: 2020:	**EPA Contact(s)**: Bill Richardson, Katherine Bentley	**Basin Commission Contact(s)**: E. Panuccio	**PRC**: 202B06
Project Description: Nutrients - Nutrient Monitoring in Tidal Tributaries to the Delaware Estuary			

Environmental Outcomes	Measures	Outputs for FY 2019 (Commitments)	Status/Comment
Implementation of nutrient criteria plan. Data in support of estuary eutrophication model.		Continued nutrient monitoring at selected tributaries to the Delaware Estuary. Monitoring Composed of: • Selected tributaries to the Delaware Estuary pending assessment of previous data; • Analytical parameters include COD, Chloride, Ammonia, Nitrate + Nitrite, TKN, Orthophosphate, Alkalinity, Total Phosphorus, Silica, Total Residue, Total Volatile Residue, Sulfate, TOC, DOC; • Eight monitoring events in 2020. Upon upload of all data to STORET/WQX, links to a pre-canned query for the resultant data set will be provided. All 2020 data uploaded by February 28, 2021 and pre-canned queries posted on DRBC web page by March 15, 2021.	

Goal 2: Protecting America's Waters			
Objective 2: Objective 2.2: Protect and Restore Watersheds and Aquatic Ecosystems			
Work Plan Component/Program: II. DRBC Criteria-Based Programs **Work years**: 2020:	**EPA Contact(s)**: Bill Richardson, Dana Hales, Joel Blanco	**Basin Commission Contact(s)**: R. MacGillivray	**PRC**: 202B06
Project Description: Water Column Integrative PCB samplers **(Monitoring Initiative)**			

Environmental Outcomes	Measures	Outputs for FY 2019 (Commitments)	Status/Comment
Assess the effectiveness of the PCB TMDLS. Evaluate methodologies for long term monitoring.		Deploy and analyze integrative samplers at several locations in the Delaware Estuary. In recent years, effluent, fish tissue, and sediment results all suggest a decrease in PCBs. Water column results from grab samples however may be too variable to track trends over time. Under this project, DRBC will evaluate several options for integrative samplers, and select, deploy, and analyze the chosen samplers. If repeated in subsequent years, integrative samplers may provide additional information on long-term trajectories of water column PCBs.	

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Work Plan Component/Program: II. DRBC Criteria-Based Programs **Work years**: 2020:	**EPA Contact(s)**: Katherine Bentley, K.L. Lai	**Basin Commission Contact(s)**: N. Suk	**PRC**: 202B06
Project Description: Estuary Eutrophication Model Development			

Environmental Outcomes	Measures	Outputs for FY 2019 (Commitments)	Status/Comment
A model for determining Delaware Estuary dissolved oxygen response to nutrient loadings.		• Continued development of the Delaware Estuary Eutrophication model. • In November 2020, DRBC will provide to EPA slides documenting the progress and status of model development. • Continued calibration and exercise of models. Model developments include but not limited to • Evaluation and enhancement of model code on an as needed basis to improve model stability • Finalization of the model grid to optimize simulation time steps and to maximize the numerical stability • Preparation of the hydrodynamic model input file: assignment of forcing tides; water temperature; salinity for open boundaries; assignment of tributary inflows; point and nonpoint source inflows for upstream	

		boundaries; assignment of metrological conditions • QA/QC on the linkage file between hydrodynamic and water quality models; optimize the linkage temporal scale • Preparation of WQ model input file for concentrations or loads from point and nonpoint sources for each state variable • Data compilation and management of model calibration targets • Development of post processor for the model output and observed data comparison • Calibration of kinetics and processes to customize the mode fit to the Delaware Estuary. Both hydrodynamic and water quality model will be calibrated/validated for the two-year period for 2018-2019. • Hydrodynamic model calibration will be performed through adjustment of bottom roughness height and turbulent scheme. The key metrics of the hydrodynamic model calibration are water surface elevation; current velocity; water temperature; and salinity • Water quality model calibration will be performed through the guidance from the model expert panel and modeling consultants. Model predicted state variables (i.e., dissolved oxygen, nitrogen	

		species, phosphorus species, phytoplankton, etc.) will be compared with the available observed data. Tens of model input parameters, kinetic coefficients and constants will be adjusted based on the current science to achieve the final calibration results. The model calibration processes are iterative processes which requires tens to hundreds of simulations.	

Goal 2: Protecting America's Waters			
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Work Plan Component/Program: IV. Assessment & Management **Work years**: 2020:	**EPA Contact(s)**: Bill Richardson, Katherine Bentley, KL Lai	**Basin Commission Contact(s)**: J. Yagecic	**PRC**: 202B06
Project Description: Spectral Analyzers for Nitrate			

Environmental Outcomes	Measures	Outputs for FY 2019 (Commitments)	Status/Comment
Continuous real-time Nitrate measurements at key locations relevant to the Delaware Etuary Eutrophication Model.		Continuation of DRBC's cooperative agreement with USGS for the temporary deployment of spectral analyzers at the Delaware River at Trenton (model boundary) and Chester (model interior). Trenton spectral analyzer is reporting nitrate. Chester spectral analyzer is reporting nitrate and dissolved organic carbon. Analyzers were deployed in 2018 and will remain through calendar September 2020. USGS will collect grab samples necessary for translating the spectral signal to nitrate concentration and (at Chester) organic carbon concentration. Real-time data is currently available at [HYPERLINK "https://waterdata.usgs.gov/usa/nwis/uv?01463500"] and [HYPERLINK "https://waterdata.usgs.gov/nwis/uv?site_no=01477050"]. The spectral signal will be back-translated so that the continuous data time series will be available for the full period of deployment. Nitrate is an important state variable in the eutrophication model. Continuous nitrate data at Trenton will provide a high-resolution boundary condition. Continuous nitrate	

		data at Chester will be used for comparison to model prediction for calibration and verification. Data will be readily available via USGS NWIS database.	

Goal 2: Protecting America's Waters			
Objective 2: Objective 2.2: Protect and Restore Watersheds and Aquatic Ecosystems			
Work Plan Component/Program: IV. Assessment & Management **Work years**: 2020:	**EPA Contact(s)**: Bill Richardson, KL Lai	**Basin Commission Contact(s)**: J. Bransky, E. Panuccio	**PRC**: 202B06
Project Description: 2020 Water Quality Assessment Report (CWA - 305(b))			

Environmental Outcomes	Measures	Outputs for FY 2019 (Commitments)	Status/Comment
Identification of Water Quality Issues and Concerns		DRBC will develop its Delaware River and Bay Water Quality Assessment Report in accordance with Section 305(b) of the Clean Water Act following the methodology published in the Federal Register in 2019. In that report, DRBC will assess whether or not water quality standards for the Delaware Estuary are being met. A draft of the 2020 report will be submitted to EPA by April 1, 2020. The final report will be published on the DRBC web site by August 31, 2020.	

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Work Plan Component/Program: IV. Assessment & Management **Work years**: 2020:	**EPA Contact(s)**: Katherine Bentley, KL Lai	**Basin Commission Contact(s)**: J. Bransky	**PRC**: 202B06
Project Description: Delaware Estuary enhanced light extinction data			

Environmental Outcomes	Measures	Outputs for FY 2019 (Commitments)	Status/Comment
Data in support of estuary eutrophication model.		DRBC will collect measurements of PAR in air, PAR at 1-meter water depth, TSS, and chlorophyll-a during 3 sampling events at approximately 60 stations per event (for a total of 180 samples) the upper portion of the Delaware Estuary. This effort is a continuation of light extinction monitoring begun in 2018. This data will be used to develop a candidate regression model for determining light extinction as a function of estuary eutrophication model state variables. All light extinction data will be collected by September 30, 2020. The model expert panel identified multiple options for incorporation of light extinction information into the eutrophication model including default internal WASP algorithms and several formats of external specification following published literature. By December 2020, we expect the model expert panel to select and recommend the best method for describing light extinction as part of the eutrophication modeling process. TSS and chlorophyll-a data will be readily available in STORET/WQX by December 31,	

		2020. PAR data will be available via the DRBC web site by December 31, 2020.	

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Work Plan Component/Program: II. DRBC Criteria-Based Programs **Work years**: 2020:	**EPA Contact(s)**: Dana Hales, Joel Blanco, Ashley Toy	**Basin Commission Contact(s)**: N. Suk	**PRC**: 202B06
Project Description: Stage 2 PCB TMDLs			

Environmental Outcomes	Measures	Outputs for FY 2019 (Commitments)	Status/Comment
Finalization of Stage 2 PCB TMDLs		Continued effort toward finalization of the Stage 2 PCB TMDLs for the Delaware River Estuary and Bay. Support EPA in preparation of responses to comments document. Finalize Stage 2 PCB TMDLs report based on comments from stake holders and general public.	

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Work Plan Component/Program: IV. Assessment & Management **Work years**: 2020:	**EPA Contact(s)**: Bill Richardson	**Basin Commission Contact(s)**: J. Bransky	**PRC**: 202B06
Project Description: Delaware River Biological Monitoring			

Environmental Outcomes	Measures	Outputs for FY 2019 (Commitments)	Status/Comment
Monitor macroinvertebrate community for water quality and aquatic life protection.		• Collect macroinvertebrate and periphyton samples, with laboratory analysis including enumeration and identification to genus level. All data entered into database and readily available. Monitoring composed of: • Biomonitoring at 25 sites including West Branch Delaware River at Hancock, East Branch Delaware River at Hancock, Delaware River Buckingham, Long Eddy, Callicoon, Castillo del Rio, Ascalona, Pond Eddy, Port Jervis, DEWA NB, Caddoo Road, Spackmans Island, Bushkill Access, Worthington Access, Arrow Island, Portland, Capush Island, Getters Island, Wy-Hit-Tuk Park, Raubs Island, Upper Black Eddy, Rush/Treasure Island, Bulls Island, Washington Crossing, Rotary Island (Trenton); • Macroinvertebrate 3-kick composite, 500-organism subsample to genus, Periphyton Ash free dry mass, benthic chlorophyll-a, Periphyton community composition, RBP habitat, and other site analyses;	

		• Monitoring is performed once in in August-September index period. All monitoring completed by September 30, 2020 and all data readily available by December 31, 2021.	

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Work Plan Component/Program: IV. Assessment & Management **Work years**: 2020:	**EPA Contact(s)**: Bill Richardson, KL Lai	**Basin Commission Contact(s)**: J. Yagecic	**PRC**: 202B06
Project Description: Enhanced Bacterial Transects, Zones 3 and Upper 4			

Environmental Outcomes	Measures	Outputs for FY 2019 (Commitments)	Status/Comment
Protection of human health associated with primary contact recreation		Monitoring of 4 boat-based transects (to be determined), 5 samples per transect, 3 times during summer 2020 for Fecal Coliform, E. Coli, and Enterococcus. Results will be assessed to determine near-shore versus far-shore differences to help interpret results collected in 2019. All results will be readily available in STORET/WQX by December 31, 2020.	

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Work Plan Component/Program: IV. Assessment & Management **Work years**: 2020:	**EPA Contact(s)**: Kelly Somers	**Basin Commission Contact(s)**: J. Yagecic	**PRC**: 202B06
Project Description: Management - Grant and infrastructure management			

Environmental Outcomes	Measures	Outputs for FY 2019 (Commitments)	Status/Comment
Effective management of 106 Resources		• 106 grant application and reporting. Outputs include successful completion of: • Mid-year joint evaluation call; • Overall grant management; • End of year comments.	